Claims

What is claimed is:

1. An input coupling for launching light into a planar waveguide of an integrated wavelength dispersive element comprising:

focusing means having optical power for focusing light at an input point on the input plane of the planar waveguide;

an input waveguide for launching a signal comprising a plurality of channels at specific wavelengths into the integrated wavelength dispersive element;

means for coupling the signal as a beam into the focusing means; and,

tilt means including a pivotal structure having a center of rotation and a thermally responsive actuator, for imparting a tilt on the beam coupled to the focusing means in response to a change in temperature.

2. An input coupling as defined in claim 1, wherein the focusing means comprises a lens and the means for coupling the signal comprises an additional lens.

3. An input coupling as defined in claims 2, wherein the pivotal structure supports the additional lens for pivotal movement relative to the lens.

4. An input coupling as defined in claim 3, wherein the lens and the additional lens are spaced apart by the pivotal structure, and each lens includes an anti-reflective coating on a surface adjacent the other lens.

5. An input coupling as defined in claim 3, wherein the integrated wavelength dispersive element comprises an arrayed waveguide grating.

6. An input coupling as defined in claim 5, wherein the input waveguide comprises optical fiber.

7. An input coupling as defined in claim 1, wherein the means for focusing comprises a lens and the means for coupling the signal comprises a mirror optically coupled to the lens for reflecting an input signal collimated in the lens.

8. An input coupling as defined in claim 7, wherein the pivotal structure supports the mirror for pivotal movement relative to the lens.

9. An input coupling as defined in claim 8, wherein a surface of the lens facing the mirror includes an anti-reflective coating.

10. An input coupling as defined in claim 8, wherein the integrated wavelength dispersive element comprises an arrayed waveguide grating.

11. An input coupling as defined in claim 1, wherein the thermally responsive actuator comprises a thermally expansive element of a different material than the pivotal structure, fixedly supported at a first end and coupled to the pivotal structure at a second end for rotating the pivotal structure about the center of rotation.

12. An input coupling as defined in claim 11, wherein the thermally responsive actuator is a passive actuator.

13. An input coupling as defined in claim 1, wherein the thermally responsive actuator is an active actuator including a controller.

14. An input coupling as defined in claim 12, wherein the thermally expansive element comprises a support for securing the pivotal structure to the arrayed waveguide grating, formed of a first material, and a leverage arm fixed at a first end relative to the support and coupled to the pivotal structure at a second end at a distance from the center of rotation such that relative thermal expansion of the leverage arm to the support causes the pivotal structure to rotate about the center of rotation.

15. An arrayed waveguide grating comprising:

a substrate for supporting an integrated arrayed waveguide grating formed therein including:

an input planar waveguide, having an input plane at an edge of the substrate and an output plane, for propagating a wavefront from an input point on the input plane to an output plane;

a grating comprising an array of waveguides optically coupled to the output plane of the input planar waveguide for receiving the wavefront, an optical length of the waveguides differing by a substantially equal amount from a first waveguide to an nth waveguide; and,

an output planar waveguide for focusing separated wavelength signals on an output plane of the output planar waveguide for coupling to output waveguides; and

an input coupling for launching a signal into the integrated arrayed waveguide grating including:

at least one input waveguide;

a lens for focusing an input signal at the input point of the input planar waveguide.

means for coupling the signal as a collimated beam into the lens; and,

tilt means including a pivotal structure having a center of rotation and a thermally responsive actuator, for imparting a tilt on the collimated beam at a focal plane of the lens in response to a change in temperature.

16. An arrayed waveguide grating as defined in claim 15, wherein the at least one input waveguide is disposed on a plane substantially parallel to the input planar waveguide having a waveguide end for launching a signal into the input planar waveguide, and wherein the means for coupling comprises a reflective element supported by the tilt means optically coupled to the lens for reflecting an input signal collimated in the lens.

17. An arrayed waveguide grating as defined in claim 16, wherein the lens is symmetrically disposed between the coupled input point and the waveguide end of a

selected one of the at least one waveguide, the lens assembly for providing an offset for coupling a signal propagating from the input waveguide to the planar waveguide.

18. An input coupling as defined in claim 17, wherein the at least one input waveguide comprises at least one integrated waveguide formed in the substrate with the integrated arrayed waveguide grating.

19. An input coupling as defined in claim 15, wherein the thermally responsive actuator comprises a thermally expansive element of a different material than the pivotal structure, fixedly supported at a first end and coupled to the pivotal structure at a second end for rotating the pivotal structure about the center of rotation.

20. An input coupling as defined in claim 19, wherein the thermally responsive actuator is a passive actuator.

21. An input coupling as defined in claim 15, wherein the thermally responsive actuator is an active actuator including a controller.

22. An input coupling as defined in claim 20,wherein the thermally expansive element comprises a support for securing the pivotal structure to the arrayed waveguide grating, formed of a first material, and a leverage arm fixed at a first end relative to the support and coupled to the pivotal structure at a second end at a distance from the center of rotation such that relative thermal expansion of the leverage arm to the support causes the pivotal structure to rotate about the center of rotation.